INSECT DISEASE REPORT
USDA FOREST SERVICE/NORTHERN REGION

Report No. 74-20

5200
August 1974

EVALUATION OF PROPOSED DWARF MISTLETOE CONTROL PROJECTS FOR FISCAL YEARS 1976-1980, FLATHEAD INDIAN RESERVATION, MONTANA

by

Oscar J. Dooling and Steve Haglund [1/]

SUMMARY

Many understory trees on proposed control areas are lightly to moderately infested with dwarf mistletoe. Control by thinning/sanitation after logging will reduce infestations to a tolerable level and significantly increase volume yields in the future. The cost-benefit ratio of control is favorable.

INTRODUCTION

The Flathead Indian Reservation is currently finishing its first 5-year dwarf mistletoe control program, [2/] [3/] and is ready to begin a second 5-year plan. An evaluation of the area included in this plan was made on July 17-18, 1974, by Dooling and Haglund.

1/ Plant Pathologist, Forest Environmental Protection; and Forester, Bureau of Indian Affairs, Flathead Indian Agency, respectively.

2/ Dooling, O. J., 1969. Evaluation of proposed dwarf mistletoe control projects, Flathead Indian Reservation. USDA Forest Service, Northern Region, State and Private Forestry. Mimeographed report.

3/ Dooling, O. J., S. Haglund, and R. Miller, 1972. Evaluation of proposed supplemental dwarf mistletoe control project, Flathead Indian Reservation. USDA Forest Service, Northern Region, State and Private Forestry Insect and Disease Report No. 72-5.

TECHNICAL INFORMATION

Causal agents.--Douglas-fir dwarf mistletoe, *Arceuthobium douglasii* Engelm.; western larch dwarf mistletoe, *A. laricis* (Piper) St. John; and lodgepole pine dwarf mistletoe, *A. americanum* Nutt. ex Engelm.

Hosts.--Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco; western larch, *Larix occidentalis* Nutt.; and lodgepole pine, *Pinus contorta* Dougl.

Type of damage.--Reduction of tree vigor, height and diameter growth, and some mortality.

Description of Areas

Location of the proposed project areas is shown in figure 1. All stands will be selectively logged over the next 5 years prior to dwarf mistletoe treatment. The treatment will be a thinning/sanitation in young vigorous second-growth stands.

1. Valley project.--The sale area covers approximately 34,600 acres; 81 MM board feet will be harvested. Presale cruise information indicates that 6,000 acres of Douglas-fir, western larch, and lodgepole pine stands are infested with dwarf mistletoe. The proposal is to treat 3,500 acres on this unit, 700 acres per year, during fiscal years 1976-1980. Stocking in the sapling and pole size classes (1 to 9 inches d.b.h.) averages 788 trees per acre.

2. Irvine project.--The sale area covers 6,500 acres; 23 MM board feet will be harvested. Approximately 3,100 acres of Douglas-fir and western larch are infested with dwarf mistletoe. The proposal is to treat 1,000 acres on this unit, 200 acres per year, during fiscal years 1976-1980. Present stocking in the sapling and pole size classes averages 500 trees per acre.

3. Clear project.--The sale area covers 5,000 acres; 9.4 MM board feet will be harvested. Cruise data indicates that 2,000 acres of Douglas-fir and western larch are infested with dwarf mistletoe. The proposal is to treat 1,500 acres on this unit, 300 acres per year, during fiscal years 1976-1980. Present stocking in the sapling and pole size classes averages 597 trees per acre.

4. Rainbow project.--The sale area covers 5,000 acres; 25 MM board feet will be harvested. One thousand acres of Douglas-fir, western larch, and lodgepole pine are infested with dwarf mistletoe. The proposal is to treat 1,000 acres on this unit, 200 acres per year, during fiscal years 1976-1980. Stocking in the sapling and pole size classes ranges from 600 to 800 trees per acre.

Figure 1.--Location of proposed dwarf mistletoe control projects, Flathead Indian Reservation.

5. Hot Springs project.--The sale area covers 4,000 acres; 25 MM board feet will be harvested. One thousand acres of Douglas-fir and western larch are infested with dwarf mistletoe. The proposal is to treat 1,000 acres on this unit, 200 acres per year, during fiscal years 1976-1980. Present stocking in the sapling and pole size classes averages 800 trees per acre.

Thinning/sanitation will be conducted on only the most productive sites where dwarf mistletoe infestation is light to moderate. Stocking will be reduced to about 200 trees per acre. Pockets of heavy infestation will not be included in the treatment areas; they will be destroyed using funds other than Pest Control funds.

DISCUSSION

Dwarf mistletoe is responsible for the most serious disease losses on the Reservation. Growth losses of 50 percent or more have been recorded on the Reservation. The dwarf mistletoes not only cause growth loss and direct mortality, but also predispose trees and entire stands to attack by fungi and insects. Over one-third of the Douglas-fir and western larch types on the Reservation are infested, and probably one-fifth of the lodgepole pine type is infested. Nonsusceptible species should be favored in thinning/sanitation where possible.

In some of the more heavily infested areas, all susceptible trees will be removed. Seed trees will be left to naturally regenerate these areas. The seed trees should be free of dwarf mistletoe, but some lightly infected trees may have to be left. This is acceptable if the infected seed trees are removed in 7 to 10 years after regeneration is established. This grace period is possible because seedlings are small targets for dwarf mistletoe seed, and the likelihood of them becoming infected within this period is small. Heavily infected trees should not be retained for seed trees because they produce less total seeds than a healthy tree, and the seed they do produce is much less viable.

Understory trees with visible infections are easy to find, but many trees probably have latent infections (no aerial dwarf mistletoe shoots). These latent infections usually become visible infections 3 to 5 years after thinning. Leaving some lightly infected trees (visible or latent) probably will do no major harm if another stand entry is possible within 15 to 20 years. Many of the stands will be ready for a commercial thinning within that period, and most of the infected stems can be removed at that time.

COST:BENEFIT ANALYSIS

A cost:benefit analysis is on file at the Flathead Indian Agency that shows a cost:benefit ratio of 1:2.4. A more recent analysis for north Idaho and Montana 4/ shows 1:8.7 in Douglas-fir and western larch and 1:1.7 in lodgepole pine. Both these analyses assume that stumpage values will remain at current levels for many years. This is probably a false assumption; stumpage prices will continue to rise, and benefits of dwarf mistletoe control will increase accordingly.

RECOMMENDATIONS

Decision for control.--Dwarf mistletoe control is recommended and is both biologically and economically sound.

Control method.--Logging of merchantable trees followed by thinning/ sanitation of the residual stand by sawing is the method selected for control.

Impact of control on other resources.--Because control will be by mechanical thinning after logging, there will be no additional adverse impact on other resources from the control operations. There will be a significant increase in the amount of forage available for livestock. Wildlife habitat will be improved. The large amount of logging and thinning slash will temporarily increase the fire hazard but new roads in some of the units will make the areas more accessible and provide for quicker initial attack on fires that do occur.

4/ Dooling, O. J., 1974. Dwarf mistletoe control - why and what? An appraisal of the Northern Region control program. USDA Forest Service, Northern Region, State and Private Forestry, Insect and Disease Report No. 74-16.